**Department of the Navy SBIR/STTR Transition Program**

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**WHO**

**SYSCOM:** NAVAIR  
**Sponsoring Program:** PMA-261  
**Transition Target:** CH-53K  
**TPOC:** (301)342-5872

**WHEN**

**Contract Number:** N68335-16-C-0095  **Ending on:** December 20, 2018

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Risk Level</th>
<th>Measure of Success</th>
<th>Ending TRL</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detail Design and Analysis</td>
<td>Med</td>
<td>Design, Analysis, Weight &amp; Cost, Durability, &amp; Impact via FEＡ</td>
<td>3-4</td>
<td>February 2015</td>
</tr>
<tr>
<td>Integrated tool &amp; Fab Dem/Val</td>
<td>Med</td>
<td>Fab. of panel, Dem/Val of tooling &amp; mfg.</td>
<td>4</td>
<td>December 2016</td>
</tr>
<tr>
<td>Durability &amp; Impact Damage Tolerance</td>
<td>Med</td>
<td>5 panels, tested: static, durability-wear &amp; impact</td>
<td>5-6</td>
<td>March 2017</td>
</tr>
<tr>
<td>impact damage/Durability Verification</td>
<td>Med</td>
<td>4 PnlS for static, durability-wear &amp; impact</td>
<td>6-7</td>
<td>December 2017</td>
</tr>
<tr>
<td>Form, Fit, Functional, + durability/ impact damage tolerance Qualification</td>
<td>Low</td>
<td>Treadway Pnl as Form- Fit&amp;Function+Static, Durability-wear &amp; Impact.</td>
<td>7-8</td>
<td>December 2018</td>
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</tbody>
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**WHAT**

**Operational Need and Improvement:** Current floor panels provide basic durability & damage tolerance. They are heavy and reduce payload & mission range + impacts operational cost. The objective/need is to develop a floor panel where the material and design configuration is tailored for durability/damage resistance & meet static and dynamic load requirements with integration of its handling systems, at a significant lower weight, and a corrosion free environment.

**Specifications Required:** The Thermoplastic composite floor panel is configured with materials and design tailored for durability/ damage tolerance, while meeting the air vehicle specification in static & dynamic load requirements for the CH-53K Cargo floor system, with the integration of the Cargo handling system, as well as operations and environmental requirements.

**Technology Developed:** Developed an Innovative CH-53K Cargo Floor panel design using advanced composites to maximize material talior-ability & configuration to achieve a durable/damage tolerant design that is significantly lighter than the current design. The selected design consists of AS4/PEEK Thermoplastic consolidated box stringers (back-to-back C-section adjoined at the lips) re-consolidated with deltoid filler and the upper and lower facesheets in a matched tooling assembly. Thermoplastic was selected due to its inherent impact damage resistance and high specific strength and stiffness to weight ratios, AS4/PEEK is also an industry qualified material. The Box-section stringers with the deltoid fillers creates a balanced overall panel stiffness, with the desired concentric vertical load path & weight optimization, thereby eliminates crushing, delamination at the corner radii, as experienced with previous applications.

**Warfighter Value:** Added payload capability & range KPPs affordably over the life of the vehicle with enhanced durability & damage tolerance. The floor panel design also enables integration of ballistic protection within its assembly construction as unitized structure; increasing the safety/survivability of the aircrew & vehicle while performing its mission.

**HOW**

**Projected Business Model:** SciMax Objective is the design and fabrication a robust cost and weight effecting Thermoplastic Composite Flooring Systems to the US Navy and the aerospace industry. We are concentrating with our technical team to achieve an optimized design that will yield an effective production ready product. SciMax has plans for a productionization set up for the floor panels in conjunction with the current floor system supplier or the US Navy.

**Company Objectives:** SciMax concentrates on design & Fabrication of efficient & cost-effective solutions with Advanced Composites to meet challenges:

1. Working with the Navy SBIR/STTR Transition Program (STP) setting to facilitate contact with the Government & the Industry/OEM decision makers for the purpose of transitioning the new technology into Phase-III, and essentially have the flooring system ready for initial production via a smooth transition, which includes machinery & equipment in place ready for LRIP.
2. SciMax Envisions other DoD programs that will benefit from the impact resistance TP flooring as well as other flight vehicle structural components, including V-22 and cargo hauling aircraft, leading edges of wings, empennages, engine intakes etc. The TP flooring can also buy its-way onto the deck of Navy vessels requiring corrosion free robust deck structure.
3. Thermoplastic Structure with Ballistic protection as an integrated single structural element (not parasitic), ready for implementation, as proposed by SciMax Technologies.

**Potential Commercial Applications:** Commercial cargo Air-Vehicles utilizing heavy cargo, can benefit from a cost-effective TP structural application reaping identical advantages in weight savings, increased payload, range & operating efficiency.

**Contact:** Joseph Bruno & Max Gross, Principal Investigator & Principal  
[bruno@scimaxtech.com](mailto:bruno@scimaxtech.com)  
631-405-9916; 516-543-2184